Citation:

Watt K, Purdie DM, Roche AM, McClure R. Acute alcohol consumption and mechanism of injury. *J Stud Alcohol.* 2006 Jan;67(1):14-21.

PubMed ID: 16536125

Study Design:

Cross-sectional Study

Class:

D - Click here for explanation of classification scheme.

Research Design and Implementation Rating:

POSITIVE: See Research Design and Implementation Criteria Checklist below.

Research Purpose:

- The purpose of this study was to determine whether injury mechanism among injured patients is differentially distributed as a function of acute alcohol consumption (quantity, type, and drinking setting).

Inclusion Criteria:

- Every injured patient who presented to the emergency department during the study period for treatment of an injury sustained less than 24 hours prior to presentation was approached for interview.
- Alcohol consumption in the 6 hours prior to injury .
- People older than 15 years who sustained injury less than 24 hours prior to presentation.
- Ethical approval for this study was obtained prior to commencement of data collection.

Exclusion Criteria:

Patients whose injury was a result of intentional self-harm were excluded.

Description of Study Protocol:

Recruitment

The study was conducted between October 2000 and October 2001 in the Gold Coast Hospital Emergency Department, Queensland, Australia. The sample comprised of 1205 injured patients.593 injured patients were recruited and completed interviews to measure alcohol consumption.

Design

- A cross-sectional case series study was conducted between October 2000 and October 2001 in the Gold Coast Hospital Emergency Department, Queensland, Australia.
- Data were collected quarterly over a 13-month period.
- Every injured patient who presented to the emergency department during the study period for treatment of an injury sustained less than 24 hours prior to presentation was approached for interview. The final sample comprised 593 injured patients (males=377).
- Three measures of alcohol consumption in the 6 hours prior to injury were obtained from self-report: quantity, beverage type, and drinking setting. The main outcome measure was mechanism of injury, which was categorized into six groups: road traffic crash (RTC), being hit by or against something, fall, cut/piercing, overdose/poisoning, and miscellaneous. Injury intent was also measured (intentional vs. unintentional).
- Three key measures or acute alcohol consumption were obtained from patients' self-reports of their drinking behavior in the 6 hours prior to sustaining injury.Three categories of the quantity of alcohol (no alcohol, low risk (females: ≤40 g; male: ≤ 60 g), risky (females : 40-60g; males: 60-100g) or high risk (females: >60 g, males: >100g). Data on usual drinking patterns were also obtained from injured patients.
- Usual weekly alcohol consumption was categorized into four levels: nondrinker, low risk (females: ≤ 100g, males : ≤200g of alcohol), and risky (females: 100-200g, males: 200-300 g of alcohol) and high risk (females:> 200g , males: >300 g of alcohol).
- Mechanism of injury was coded into six binary variables: road traffic crash (RTC) versus non-RTC, being hit by or against something (including some type of assaults but also including other injuries such as being hit by a golf ball) versus not being hit, fall versus nonfall, cut/piercing versus no cut/piercing, over-dose (OD)/poisoning versus non-OD poisoning, and miscellaneous (e.g., burns, immersions, electrocutions, hypothermia) versus

nonmiscellaneous.
- Owing to small numbers, patients presenting with OD/poisoning complaints were included in the miscellaneous category for analyses (leaving five binary variables.
- Participants provided one of three responses (unintentional , intentional and intentional self –harm).

Blinding used (if applicable): not applicable

Intervention (if applicable): not applicable

Statistical Analysis

- To determine whether, given an injury, mechanism is differentially distributed as a function of acute alcohol consumption.
- The association between each of the three measures of acute alcohol consumption and each of the six binary mechanisms of injury variables was examined in separate models.
- Crude odds ratios (ORs) with 95% confidence intervals (CIs) were calculated to estimate the crude association between each mechanism of injury and various factors known or hypothesized to influence injury.
- All variables found to be significantly associated with mechanism of injury in the crude analyses, which could therefore possibly confound any associations between acute alcohol consumption and mechanism of injury, were then included in multivariate analyses (a series of binary logistic regression models).
- If no changes to the ORs of the other variable was not included in the final model for that measure of acute alcohol consumption and mechanism of injury.
- This analytical approach allows the computation of the association between acute alcohol consumption for a given injury mechanism compared with all other injury mechanisms.

Data Collection Summary:

Timing of Measurements

- Data were collected quarterly over the study period.
- Alcohol consumption in the 6 hours prior to injury.

Dependent Variables

- Mechanism of injury, injury intent (intentional and unintentional)
- Situational variables relative to time of injury (i.e., location, activity, and companions) and risk-taking behavior
- Traffic crash (RTC), being hit by or against something, fall, cut/piercing, overdose/poisoning, and miscellaneous

Independent Variables

- General demographic information
- Acute alcohol and substance use based on self-report: quantity, beverage type, and drinking setting

Control Variables

Description of Actual Data Sample:

Initial N: 1205 injured patients. 789 eligible patients, 196 were not interviewed (refusals: n=94; too ill or severely injured: n=37; non English speaking: n=3, discharged prior to interview : n=56; other –e.g., cognitively or hearing impaired: n=6), yielding a total of 593 interviewed injured patients (75.2%).

Attrition (final N): 593 patients in the final sample. 416 were not eligible to participate.

Age: People older than 15 years.

Ethnicity: not reported

Location: Australia

Summary of Results:

Key Findings

- No age or gender differences were observed between participants and non participants, but there were slight differences in mechanism of injury (i.e., significantly more nonparticipants presented with OD/poisoning complaints (18.0% vs 6.8%, p<0.001).
- After controlling for relevant confounding variables, neither quantity nor type of alcohol was significantly associated with injury mechanism.
- Drinking in a licensed premise in the 6 hours prior to injury was significantly more common than not drinking alcohol (OR=2.59, 95% CI=1.4-4.9) among patients with injuries from being hit by/against something, compared with patients with other injuries.
- However, drinking setting (i.e., licensed premise) was significantly associated with increased odds of sustaining an intentional versus unintentional injury (odds ratio [OR] = 2.79, 95% confidence interval [CI] = 1.4-5.6); injury through being hit by/against something versus other injury types (OR = 2.59, 95% CI = 1.4-4.9); and reduced odds of sustaining an injury through RTC versus non-RTC (OR = 0.02, 95% CI = 0.004-0.9), compared with not drinking alcohol prior to injury.
- There were no interactions among being hit by or against something, drinking setting , beverage type, quantity of acute alcohol consumption, or any of the situational or demographic confounding variable identified (p<0.05).
- There were no interactions among being hit by or against something, drinking setting, beverage type, quantity of acute alcohol consumption, or any of the situational or demographic confounding variables identified (p>0.05).
- Patients injured through RTC were less likely than patients with non-RTC injuries to report drinking in any setting in the 6 hours prior to injury, when relevant confounding variables were controlled (i.e., age, income, employment, marital status, location, activity and companions at time of injury.
- The only significant (inverse) association was that observed between drinking in a licensed premise and RTC injury (OR=0.02, 95% CI=0.004-0.9).
- Patients with RTC injuries were more likely to report not drinking alcohol in the 6 hours prior to sustaining injury than to report drinking in a licensed premise, compared with non-RTC injured patients.
- The data suggest a significant interaction between acute drinking setting and usual drinking pattern (drinking in the home environment and usual low-risk drinking (p=0.006); drinking in “other” settings and usual low-risk drinking (p=0.038).
- There were no other significant interactions among RTC, drinking setting prior to injury, or any of the situational or demographic confounding variables identified (p>0.05).
- After adjusting for relevant confounding variables (gender, private health insurance, location and activity at time of injury), the associations among sustaining intentional injury and both quantity and type of acute alcohol consumption were no longer significant.
- Compared with unintentionally injured patients those with intentional injuries were significantly more likely to report drinking in a licensed premise in the 6 hours prior to injury than to report not drinking alcohol (OR=2.79, 95% CI=1.4-5.6).
- There were no interactions between either quantity or type of alcohol consumed and intentional injury or any of the situational or demographic confounding variables identified (p>0.05).

Author Conclusion:

- No previous analytical studies have examined the relationship between injury mechanism and acute alcohol consumption (quantity, type, and setting) across all types of injury and all injury severities while controlling for potentially important confounders (demographic and situational confounders, risk-taking behavior, substance use, and usual drinking patterns).
- These data suggest that among injured patients, mechanism of injury is not differentially distributed as a function of quantity or type of acute alcohol consumption but may be differentially distributed as a function of drinking setting (i.e., RTC, intentional injury, being hit).
- Therefore, prevention strategies that focus primarily on the quantity and type of alcohol consumed should be directed generically across injury mechanisms and not limited to particular cause of injury campaigns.

Reviewer Comments:

Authors note the following limitations:

- *Data in the study are inherently conservative, as patients with very serious injuries were not interviewed*
- *Use of self-report as the measure of alcohol consumption*

Research Design and Implementation Criteria Checklist: Primary Research

Relevance Questions

1.	Would implementing the studied intervention or procedure (if found successful) result in improved outcomes for the patients/clients/population group? (Not Applicable for some epidemiological studies)	N/A

2.	Did the authors study an outcome (dependent variable) or topic that the patients/clients/population group would care about?	Yes
3.	Is the focus of the intervention or procedure (independent variable) or topic of study a common issue of concern to nutrition or dietetics practice?	Yes
4.	Is the intervention or procedure feasible? (NA for some epidemiological studies)	N/A

Validity Questions

1.	**Was the research question clearly stated?**	Yes
1.1.	Was (were) the specific intervention(s) or procedure(s) [independent variable(s)] identified?	Yes
1.2.	Was (were) the outcome(s) [dependent variable(s)] clearly indicated?	Yes
1.3.	Were the target population and setting specified?	Yes
2.	**Was the selection of study subjects/patients free from bias?**	Yes
2.1.	Were inclusion/exclusion criteria specified (e.g., risk, point in disease progression, diagnostic or prognosis criteria), and with sufficient detail and without omitting criteria critical to the study?	Yes
2.2.	Were criteria applied equally to all study groups?	Yes
2.3.	Were health, demographics, and other characteristics of subjects described?	???
2.4.	Were the subjects/patients a representative sample of the relevant population?	Yes
3.	**Were study groups comparable?**	N/A
3.1.	Was the method of assigning subjects/patients to groups described and unbiased? (Method of randomization identified if RCT)	N/A
3.2.	Were distribution of disease status, prognostic factors, and other factors (e.g., demographics) similar across study groups at baseline?	N/A
3.3.	Were concurrent controls used? (Concurrent preferred over historical controls.)	N/A
3.4.	If cohort study or cross-sectional study, were groups comparable on important confounding factors and/or were preexisting differences accounted for by using appropriate adjustments in statistical analysis?	N/A

3.5.	If case control or cross-sectional study, were potential confounding factors comparable for cases and controls? (If case series or trial with subjects serving as own control, this criterion is not applicable. Criterion may not be applicable in some cross-sectional studies.)	N/A
3.6.	If diagnostic test, was there an independent blind comparison with an appropriate reference standard (e.g., "gold standard")?	N/A
4.	**Was method of handling withdrawals described?**	Yes
4.1.	Were follow-up methods described and the same for all groups?	Yes
4.2.	Was the number, characteristics of withdrawals (i.e., dropouts, lost to follow up, attrition rate) and/or response rate (cross-sectional studies) described for each group? (Follow up goal for a strong study is 80%.)	Yes
4.3.	Were all enrolled subjects/patients (in the original sample) accounted for?	Yes
4.4.	Were reasons for withdrawals similar across groups?	N/A
4.5.	If diagnostic test, was decision to perform reference test not dependent on results of test under study?	N/A
5.	**Was blinding used to prevent introduction of bias?**	Yes
5.1.	In intervention study, were subjects, clinicians/practitioners, and investigators blinded to treatment group, as appropriate?	N/A
5.2.	Were data collectors blinded for outcomes assessment? (If outcome is measured using an objective test, such as a lab value, this criterion is assumed to be met.)	Yes
5.3.	In cohort study or cross-sectional study, were measurements of outcomes and risk factors blinded?	Yes
5.4.	In case control study, was case definition explicit and case ascertainment not influenced by exposure status?	N/A
5.5.	In diagnostic study, were test results blinded to patient history and other test results?	N/A
6.	**Were intervention/therapeutic regimens/exposure factor or procedure and any comparison(s) described in detail? Were interveningfactors described?**	Yes
6.1.	In RCT or other intervention trial, were protocols described for all regimens studied?	N/A
6.2.	In observational study, were interventions, study settings, and clinicians/provider described?	Yes
6.3.	Was the intensity and duration of the intervention or exposure factor sufficient to produce a meaningful effect?	N/A
6.4.	Was the amount of exposure and, if relevant, subject/patient compliance measured?	N/A

6.5.	Were co-interventions (e.g., ancillary treatments, other therapies) described?	N/A
6.6.	Were extra or unplanned treatments described?	N/A
6.7.	Was the information for 6.4, 6.5, and 6.6 assessed the same way for all groups?	N/A
6.8.	In diagnostic study, were details of test administration and replication sufficient?	N/A
7.	**Were outcomes clearly defined and the measurements valid and reliable?**	Yes
7.1.	Were primary and secondary endpoints described and relevant to the question?	Yes
7.2.	Were nutrition measures appropriate to question and outcomes of concern?	Yes
7.3.	Was the period of follow-up long enough for important outcome(s) to occur?	Yes
7.4.	Were the observations and measurements based on standard, valid, and reliable data collection instruments/tests/procedures?	Yes
7.5.	Was the measurement of effect at an appropriate level of precision?	Yes
7.6.	Were other factors accounted for (measured) that could affect outcomes?	Yes
7.7.	Were the measurements conducted consistently across groups?	Yes
8.	**Was the statistical analysis appropriate for the study design and type of outcome indicators?**	Yes
8.1.	Were statistical analyses adequately described and the results reported appropriately?	Yes
8.2.	Were correct statistical tests used and assumptions of test not violated?	Yes
8.3.	Were statistics reported with levels of significance and/or confidence intervals?	Yes
8.4.	Was "intent to treat" analysis of outcomes done (and as appropriate, was there an analysis of outcomes for those maximally exposed or a dose-response analysis)?	N/A
8.5.	Were adequate adjustments made for effects of confounding factors that might have affected the outcomes (e.g., multivariate analyses)?	Yes
8.6.	Was clinical significance as well as statistical significance reported?	Yes
8.7.	If negative findings, was a power calculation reported to address type 2 error?	N/A
9.	**Are conclusions supported by results with biases and limitations taken into consideration?**	Yes
9.1.	Is there a discussion of findings?	Yes

	9.2.	Are biases and study limitations identified and discussed?	Yes
10.	**Is bias due to study's funding or sponsorship unlikely?**		Yes
	10.1.	Were sources of funding and investigators' affiliations described?	Yes
	10.2.	Was the study free from apparent conflict of interest?	Yes